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Bank Competition in the Middle East and Northern Africa Region

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Abstract

This paper studies the extent of bank competition in the Middle East and Northern Africa region during 1994–2008, using non-structural measures of competition such as the H-statistic and the Lerner index. Both these measures suggest that banking sector competition in the region is lower relative to other regions and has not improved in recent years. An analysis of the determinants of competition across countries suggests that lower levels of competition in the Middle East and Northern Africa are explained by the region's worse credit information environment and lower market contestability.

This paper—a product of the Finance and Private Sector Development Division, Middle East and Northern Africa Region; and Finance and Private Sector Development Team, Development Research Group—is part of a larger effort in these departments to analyze bank competition in the Middle East and Northern Africa Region, in particular, and across developing countries more generally. Policy Research Working Papers are also posted on the Web at http://econ.worldbank.org. The authors may be contacted at danzoategui@worldbank.org, mmartinezperia@worldbank.org, rrocha@worldbank.org.

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1. Introduction

Banking sectors in the Middle East and Northern Africa Region (MENA) are among the biggest and deepest in the developing world (see Figure 1), but are they competitive? This paper investigates the extent of bank competition in the MENA region, compares it to that observed in other regions, and analyzes the factors that explain the differences in bank competition between MENA and other regions. Assessing bank competition in MENA is important, because an extensive literature has shown that higher levels of bank competition are associated with lower prices for banking products, increased access to finance, and greater bank efficiency. At the same time, recent studies have shown that bank competition can also be good for stability by limiting the emergence of "too big to fail" institutions that take excessive risks.[1]

There are two main approaches to measuring bank competition: the structural approach and the non-structural approach. As the name suggests, the structural approach assesses bank competition by examining measures of market structure such as concentration ratios (the share of assets held by the top 3/5 institutions) or indices (e.g., the Herfindhal index). The theoretical justification for using concentration as a measure of competition comes from the so called Structure-Conduct-Performance paradigm, which postulates that fewer and larger firms (higher concentration) are more likely to engage in anticompetitive behavior.[2] However, studies have shown that at times concentration is not a reliable measure of competition (see Cetorelli, 1999) and the link between concentration and performance is not always positive as suggested by the Structure-Conduct-Performance paradigm (see Jackson, 1992).

In contrast to the structural approach, the non-structural approach, based on the so-called "New Empirical Industrial Organization literature", measures competition without using explicit information about the structure of the market. Instead, non-structural measures focus on obtaining estimates of market power from the observed behavior of banks. For example, Panzar and Rosse (1987) show that the sum of the elasticities of a firm's revenue with respect to the firm's input prices - the so-called H-statistic - can be used to identify the extent of competition in

[1] For studies on the impact of competition see Koskela and Stenbacka (2000), Beck, Demirguc-Kunt and Maksimovic (2004), Beck, Demirguc-Kunt, and Levine (2006), Cetorelli and Strahan (2006), Carletti, Hartmann, and Spagnolo (2007), Schaeck and Cihak (2008), among others.
[2] For a discussion on the Structure-Conduct-Performance paradigm see Berger (1995).

a market. Under perfect competition, the H-statistic should be equal to one, since any increase in input prices should lead to a one-to-one increase in total revenues. This is true because those firms that cannot cover their increase in input prices will be forced to exit the market. By contrast, H will be negative if the firm operates as a monopoly—an upward shift in the marginal cost curve will be associated with a reduction in revenue as a result of the optimality condition for the monopolist. If the banking sector is characterized by monopolistic competition, the H statistic will lie between zero and one. An alternative non-structural measure of competition, the Lerner index, measures the markup firms charge their customers by calculating the disparity between price and marginal costs expressed as a percentage of the price. Higher values of the Lerner index imply lower levels of bank competition.

Though there is an extensive literature using non-structural measures to assess competition in many developed and in some developing countries, to the best of our knowledge, there are only three papers that conduct this kind of analysis for the MENA region.[3] All three compute the H-statistic as the measure of competition. Murjan and Ruza (2002) investigate the degree of competition during the period 1993-1997 in nine MENA countries.[4] The authors find that MENA banking sectors operate under monopolistic competition and Gulf Cooperation Council's (GCC) economies tend to be less competitive than non-oil producing countries. Analyzing bank competition in GCC economies (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates) for the period 1993-2002, Al-Muharrami et al. (2006) also concludes that the banking sectors in these economies operate under monopolistic competition. A more recent paper, Turk-Ariss (2009), analyzes competition in 12 MENA economies during the period 2000-2006.[5] This paper also conducts an investigation of the factors that explain differences in bank competition across MENA countries. Consistent with previous research, the

[3] Studies using non-structural measures to examine competition in developed countries include: Nathan and Neave (1989), Shaffer (1993), Molyneux et al. (1994, 1996), Bikker and Groeneveld (1998), Hondroyiannis et al. (1999), De Bandt and Davis (2000), Bikker and Haaf (2002), Hempell (2002), Angelini and Cetorelli (2003), Coccorese (2004, 2005) , Fernandez de Guevara et al. (2005, 2007), Gischer and Stiele (2008), and Carbó et al. (2009). There are fewer studies focusing on developing countries. These include: Gelos and Roldos (2004), which examine banking sector competition in Argentina, Brazil, Chile, Czech Republic, Hungary, Mexico, Poland, and Turkey; Mkrtchyan (2005), which focuses on Armenia; Prasad and Ghosh (2005), which investigates the case of India; Mamatzakis et al. (2005), Drakos and Konstantinou (2005), and Yildirim and Philippatos (2007) that study competition in Central and Eastern European countries; and Levy Yeyati and Micco (2007), which analyzes banking competition in Latin America.

[4] Bahrain, Egypt, Jordan, Kuwait, Oman, Qatar, Saudi Arabia, Tunisia, and United Arab Emirates

[5] The countries considered in Turk-Ariss (2009) are Algeria, Bahrain, Jordan, Kuwait, Lebanon, Morocco, Oman, Qatar, Saudi Arabia, Tunisia, Turkey, and United Arab Emirates.

paper finds that most banking sectors in MENA operate under monopolistic competition. Furthermore, the paper concludes that indicators of market contestability and activity restrictions are important factors in determining the degree of competition across countries in the region.

Our paper contributes to the study of bank competition in MENA in four different ways. First, the study analyzes two distinct measures of competition - the H-statistic and the Lerner index - over a longer period of time, 1994-2008. Second, the paper examines the behavior of competition within MENA over time and tests for differences across two sub-periods: 1994-2001 and 2002-2008. Third, the paper compares the extent of banking sector competition in MENA to that observed in other regions of the developing world. Finally, the paper conducts an analysis of the factors that explain differences in competition between MENA and other regions.

Our estimations of the H-statistic and the Lerner index show that banking sectors in MENA operate under monopolistic competition. Furthermore, comparisons over time indicate that competition has not improved and, in many cases, has worsened over time within MENA. Relative to other regions, MENA is lagging behind in terms of bank competition. Our evaluation of the factors explaining differences in banking sector competition between MENA and other regions suggests that a worse credit information environment and stricter regulations and practices governing bank entry are to blame.

The rest of the paper is organized as follows. Section 2 explains the methodological approach and describes the data we use to obtain the non-structural measures of competition. Section 3 presents the non-structural measures of competition for each country in MENA, analyzes their behavior over time, and compares bank competition in MENA to that in other developing countries. Section 4 details the methodology we employ to analyze differences in competition between MENA and other regions. Section 5 reports the results of our analysis of the drivers of competition in MENA. Section 6 concludes.

2. Methodologies and data to compute the non-structural measures of competition

Based on the Panzar and Rosse (1982, 1987) methodology and following the empirical strategy pursued by Classes and Laeven (2004), we obtain the H-statistic by estimating equation (1) below:

$$Ln(P_{it}) = \alpha_i + \beta_1 \ln(W_{1,it}) + \beta_2 \ln(W_{2,it}) + \beta_3 \ln(W_{3,it}) + \gamma \ln(Z_{,it}) + \delta D + \varepsilon_{it} \quad (1)$$

where *i* denotes banks and *t* denotes years. *P* is the ratio of gross revenues to total assets (proxy for banks' output price), W_1 is the ratio of interest expenses to total deposits and money market funding (proxy for input price of deposits), W_2 is the ratio of personnel expenses to total assets (proxy for input price of labor) and W_3 is the ratio of other operating and administrative expenses to total assets (proxy for input price of equipment/fixed capital). *Z* is a matrix of controls including the ratio of equity to total assets, the ratio of net loans to total assets, and the logarithm of assets. *D* is a matrix of year dummies. Finally, α_i denote bank-level fixed effects.

The H-statistic equals $\beta_1+\beta_2+\beta_3$, the sum of the input price elasticities of total revenues. Conceptually, the statistic measures the responsiveness of bank revenues to input prices. An H-statistic less or equal to 0 is interpreted as a sign of a monopoly; H equal to 1 indicates perfect competition, and H is between 0 and 1 when the sector operates under monopolistic competition.

The test of perfect competition is only valid if the market is in long-run equilibrium. To verify this condition, the following regression is estimated:

$$Ln(ROA_{it}) = \alpha_i + \beta_1 \ln(W_{1,it}) + \beta_2 \ln(W_{2,it}) + \beta_3 \ln(W_{3,it}) + \gamma \ln(Z_{,it}) + \delta D + \varepsilon_{it} \quad (2)$$

Where *ROA* is the pre-tax return on assets. Because *ROA* can take on negative values, we compute the dependent variable as $ln(1+ROA)$. We define the equilibrium E-statistic as $\beta_1+\beta_2+\beta_3$ from equation (2). The test of long-run equilibrium involves testing whether $E=0$. In other words, the market is in equilibrium if return on assets is not related to input prices.

The Lerner Index is computed using the formula $(P-MC) / P$, where *P* is the price of banking outputs and MC is the marginal costs. Following the approach in Fernandez de Guevara, Maudos and Perez (2005, 2007) and Berger, Klapper and Turk-Ariss (2008), we proxy bank output using total assets, *P* is calculated as total bank revenues over assets, and *MC* is calculated by taking the derivative from a translog cost function shown in equation (3):

$$Ln(C_{it}) = a_{0i} + b_0 ln(Q_{it}) + b_1 0.5 [ln(Q_{it})]^2 + a_1 ln(W_{1it}) + a_2 ln(W_{2it}) + a_3 ln(W_{3it}) +$$
$$+ b_2 0.5 ln(Q_{it})*ln(W_{1it}) + b_3 0.5 ln(Q_{it})*ln(W_{2it}) + b_4 0.5 ln(Q_{it})*ln(W_{3it}) +$$
$$+ a_4 ln(W_{1it})*ln(W_{2it}) + a_5 ln(W_{1it})*ln(W_{3it}) + a_6 ln(W_{2it})*ln(W_{3it}) +$$
$$+ a_7 0.5[ln(W_{1it})]^2 + a_8 0.5[ln(W_{2it})]^2 + a_9 0.5[ln(W_{3it})]^2 + \delta D + u_{it} \quad (3)$$

where i denotes banks and t denotes years. C is total operating plus financial costs, Q is total assets, W_1, W_2, and W_3 are the same input prices used in equations (1) and (2) and defined above. D and α_{0i} denote time effects and bank-level fixed effects, respectively. As in most papers, our estimations impose the restrictions of symmetry and degree one homogeneity in the price of inputs.[6]

We compute the H-statistic and the Lerner index using bank-level balance sheet and income statement data from Bankscope for the period 1994-2008. The sample for MENA includes data on 250 commercial and Islamic banks, operating in 12 MENA countries, namely: Algeria, Bahrain, Egypt, Jordan, Kuwait, Lebanon, Morocco, Oman, Qatar, Saudi Arabia, Tunisia, and United Arab Emirates. Table 1 shows the number of banks and observations for each country in our sample.

We compare competition in MENA to that in other regions using similar Bankscope data for 3,785 banks operating in 122 countries across 6 regions. Table 2 lists the countries included in each region and reports the number of banks and observations that go into the calculations of the H-statistic and the Lerner index for each region.

3. Empirical results on the non-structural measures of competition

3.a. H- Statistic

Table 3 shows H-statistics for individual countries in MENA over two periods: 1994-2001 and 2002-2008. Also, this table reports p-values for tests of whether H is equal to 0 and the market can be best characterized as a monopoly or H is equal to 1 and the market operates under perfect competition.

[6] However, the results do not change if we drop these constraints.

Considering the most recent period (2002-2008) in all countries we are able to reject the null that the banking sector is best characterized by a monopoly (null H=0). At the same time, with the exception of Oman, we are able to reject the hypothesis of perfect competition (i.e., the null that H=1) across all countries. Overall, this evidence suggests that banking sectors in MENA are best characterized as markets operating under monopolistic competition. Furthermore, Table 3 reveals that, in general, competition throughout MENA has either declined or not changed significantly since the second half of the 1990s. The drop in the value of the H- statistic between 1994-2001 and 2002-2008 is statistically significant in the case of Tunisia and Kuwait. For the remaining countries we find no evidence of changes and, in particular, improvements in competition since the mid-1990s.

Table 4 reports values of the H-statistic across regions, calculated over the period 1994-2008, and for the most recent 2002-2008 period.[7] In the case of the MENA region, to distinguish oil producers from other countries, we report individual statistics for Gulf Cooperation Council (GCC) countries – Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and United Arab Emirates-, separate from the rest, which we label as "Non-GCC" countries. The H-statistics for GCC countries are lower than those for non-GCC countries, suggesting that the former are less competitive than the latter, however, these differences are not statistically significant.

Comparing MENA to other regions, we find that the H-statistic for MENA is significantly lower than that for countries in Eastern Europe, the Former Soviet Union, Latin America, and South Asia both in the most recent period, 2002-2008, and in the longer period, 1994-2008. On the other hand, we find no difference in the H-statistic for MENA and that for East Asia and Sub-Saharan Africa, the two regions with the lowest level of banking sector competition according to the H.

3.b. Lerner index

Figure 2 shows plots of the Lerner index for each of the 12 MENA countries throughout 1994-2008. It is clear from these graphs that most countries in MENA seem to have witnessed an

[7] To calculate the H-statistic for each region, we pool the observations for all countries in each region, while including country and time fixed effects, and estimate one value of the H-statistic for each region following the methodology described in Section 2.

increase in the Lerner index. Table 5 reports the average for the Lerner index across the same two periods we examined in the case of the H-statistic, namely 1994-2001 and 2002-2008. Also, this table reports the p-values for a t-test of whether the average of the Lerner index changes across periods. With the exception of Egypt, where the Lerner seems to have declined over time, and Morocco and Tunisia, where we cannot reject the null of no change, for all other countries, our tests indicate an increase in market power among banks over time.

Relative to other regions, the Lerner index for both Non-GCC but, especially, for GCC countries is higher. Table 6 reports the average Lerner index across regions for the period 1994-2008 and for the recent period, 2002-2008. Over the most recent period, we see that the average Lerner for GCC countries is higher than those for all other regions. Furthermore, these differences are statistically significant in all cases. In the case of Non-GCC countries, the Lerner index is higher for these countries relative to that for Eastern Europe, Latin America, and Sub-Saharan Africa, but the differences do not appear to be statistically significant. Overall, the evidence based on the non-structural measures of competition suggests that banking sectors in MENA, and, in particular, those in GCC countries are less competitive than those in most other regions.

4. Methodology and data to evaluate what drives differences in competition across regions

In order to understand why banking sectors in MENA are less competitive than those in other regions in the developing world, we conduct an empirical analysis of the determinants of competition across countries. We use the H-statistic as our summary measure of competition across countries.[8] In particular, using bank-level Bankscope data for the period 2002-2008, we calculate the H-statistic for all countries for which at least 50 observations are available. With these data we run cross-country regressions in order to investigate the potential factors that explain banking competition in MENA.

Our estimations include the following two steps. First, as shown in equation (4) below, we regress the H-statistics against a dummy for countries in MENA (i.e., a variable that takes

[8] However, results do not change significantly if we use the Lerner index instead.

values of 1 for countries in the region and 0 otherwise). Equation (4) is estimated to determine whether indeed as reported in Section 3 the non-structural measures of competition for MENA are different and, in particular, are worse than for all other regions. In other words, the purpose of estimating equation (4) is to test whether the MENA dummy is negative and significant, suggesting that the value of the H-statistic is lower among countries in MENA.

$$H\text{-}statistic_i = \beta_0 + \beta_1 MENA_i + u_i \quad (4)$$

Second, we estimate equation (5) incorporating potential determinants of competition. The purpose of estimating equation (5) is to assess the factors that help explain the differences in competition between MENA and other regions. If once we control for the additional variables in equation (5), the MENA dummy is no longer significant, we can establish the factors driving differences in competition by looking at the variables that are statistically significant.

$$H\text{-}statistic_i = \beta_0 + \beta_1 MENA_i + \beta_2 Concentration_i + \beta_3 Contestability_i + \beta_4 Credit\ information\ environment_i + \beta_5 Non\text{-}bank\ financial\ institutions_i + e_i \quad (5)$$

Following Claessens and Laeven (2004) and Turk-Ariss (2009), we consider a number of factors as potential determinants of competition. First, we include a measure of concentration. According to the Structure-Conduct-Performance paradigm, we would expect a negative association between concentration and competition. In equation (5) *Concentration* refers to the average share of assets held by the top three banks over the period 2002-2008. We use data from Bankscope to compute the aforementioned variable. The second column of Table 7 shows the average concentration ratios across regions. The average concentration ratio for MENA (57.8%) is higher than that of South Asia, East Asia, and Latin America, but it is lower than that of Former Soviet Union, Eastern Europe, and Sub-Saharan Africa. Hence, the examination of the concentration ratios reveals that while concentration in MENA is high, the ratios are line and, in many cases, are lower than what we observe in other regions.

Second, we consider as potential determinants of competition a number of variables that help characterize the degree to which the banking sector is contestable (i.e., it has low barriers to entry and exit).We expect more contestable markets to be more competitive since the threat of entry and exit reduces the ability of incumbents to exercise market power (see Claessens and

Laeven, 2004 and Turk-Assis, 2009). Due to lack of data on barriers to exit for several countries, we only focus on bank entry. Specifically, *Contestability* is a matrix which includes the following variables: (i) initial capital required for a bank to start operations, (ii) the number of requirements that have to be satisfied by institutions applying for a banking license, and (iii) the percentage of applications for licenses that have been denied. These data come from the World Bank 2007 Survey on Bank Regulation and Supervision.[9]

Columns 3 to 5 of Table 7 compare the mentioned entry requirements in MENA with those of other regions. We find that with the exception of East Asia, where capital requirements are also very high, capital requirements in MENA and, in particular, in GCC countries significantly exceed those of all other regions. Also, the number of procedures a bank must comply with to obtain a license is higher in MENA relative to most regions.[10] When it comes to the number of applications denied, the rejection rate in MENA also exceeds those of all other regions.

Third, we consider a measure of the scope, access, and quality of credit information to capture the extent to which credit information is widely available and shared by all banks. Dell'Ariccia et al. (1999) show that to the extent that access to credit information is limited, incumbent banks are more able to exercise market power and to limit bank entry. Hence, we expect a positive association between the scope, access, and quality of credit information and the degree of competition across countries. We measure the *Credit information environment* as the average over the period 2005-2008 of the index of credit information compiled by the World Bank *Doing Business Indicators.* This index takes values from 0 to 6 with larger numbers representing greater scope, access, and quality of credit information. Column 6 of Table 7 shows that MENA's credit information index (2.9) is relatively low compared to other developing regions. In fact, it is only higher than Sub-Saharan Africa (2.0) and Former Soviet Union (2.0).

[9] These data can be found at http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTRESEARCH/0,,contentMDK:20345037~pagePK:64214825~piPK:64214943~theSitePK:469382,00.html

[10] Across countries in MENA, there is no variation in the number of requirements for entry. Across all countries, banks are required to present (1) draft by laws, (2) intended organizational charts, (3) financial projections for the first years of operation, (4) financial information on potential shareholders, (5) background/experience of future directors, (6) background/experience of future managers, (7) sources of funds, and (8) intended market differentiation.

Finally, as in Claessens and Laeven (2004), in order to gauge the impact of the presence of non-bank institutions we include two variables: (i) the share of assets held by insurance companies, pension, and mutual funds, and (ii) the ratio of stock market capitalization to GDP. We expect that in countries with more important non-bank financial institutions and deeper capital markets banks will face higher levels of competition. The last two columns of Table 7 show that MENA's capital markets are larger than those of the other developing regions. In turn, non-bank financial institutions' size in MENA is smaller than that of all regions except for the economies of the Former Soviet Union.

5. Empirical results for the factors driving differences in competition across regions

Table 8 shows the results for the estimations exploring the determinants of difference in competition between MENA and other regions. Column 2 of Table 8 shows that the H-statistic is lower in MENA relative to other developing countries around the world. This confirms what we established in Section 3, namely, that banking sectors in MENA are less competitive relative to those in other regions. In columns 3 through 5, we include additional variables to try to explain the factors driving the differences observed in the extent of competition in MENA vis-a-vis other countries. We find that the index capturing the credit information environment and measures of the ease of entry into banking help explain differences in competition across countries. In particular, once we control for these variables, we find no difference between competition in MENA and other regions, suggesting that these are the factors that explain why competition in MENA is lower. At the same time, we find evidence that in countries where the size of non-bank financial intermediaries (stock markets, pension funds, mutual funds, and insurance companies) is larger, competition is more pronounced.

6. Conclusions

Banking sectors in MENA are relatively developed, but are they competitive? This paper provides significant evidence that banking sector competition in MENA is lower than in most regions of the developing world and has not improved over time. In particular, non-structural measures of competition such as the H-statistic and the Lerner Index show that banking sectors in MENA are lagging behind in terms of competition.

Our evaluation of the factors explaining differences in banking sector competition between MENA and other regions suggests that a worse credit information environment and stricter regulations and practices governing bank entry are to blame. Hence, measures to promote competition in MENA should focus on making banking sectors in the region more contestable and on improving the scope, access, and quality of credit information among banks. Also, we find that countries where stock markets and other non-bank financial intermediaries play a significant role tend to have more competitive banking sectors, suggesting that policies that promote these other sectors should also be in MENA's policy-makers' agendas.

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Table 1: MENA sample (1994-2008)

Country	Number of banks	Number of observations
Algeria	17	93
Bahrain	27	191
Egypt	34	381
Jordan	13	163
Kuwait	10	104
Lebanon	66	605
Morocco	11	86
Oman	10	91
Qatar	8	76
Saudi Arabia	13	138
Tunisia	17	190
United Arab Emirates	24	214

Table 2: Other developing regions sample (1994-2008)

Region	Countries	Number of banks	Number of observations
East Asia and Pacific	Cambodia, China, Fiji, Indonesia, Korea, Laos, Malaysia, Micronesia, Mongolia, Myanmar, Papua New Guinea, Philippines, Thailand, Tonga, Vanuatu, Vietnam, Western Samoa.	458	2922
Eastern Europe	Albania, Bosnia-Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Macedonia (FYROM), Montenegro, Poland, Romania, Serbia, Slovenia	426	2748
Former Soviet Union	Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine, Uzbekistan.	1245	5492
Latin America and Caribbean	Argentina, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominica, Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Saint Lucia, St. Kitts and Nevis, Suriname, Uruguay, Venezuela.	960	6082
South Asia	Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, Sri Lanka.	194	1918
Sub-Saharan Africa	Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Congo, Congo Democratic Rep., Eritrea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Ivory Coast, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome & Principe, Senegal, Seychelles, Sierra Leone, South Africa, Sudan, Swaziland, Tanzania, Togo, Uganda, Zambia.	502	3003

Table 3: H-statistics for MENA countries

Country	Period	H-stat	Std. error	P-value null H=0	P-value null H=1	P-value null H[94-01]= H[02-08]
Algeria	1994-2001	0.614	0.161	0.002	0.029	0.575
	2002-2008	0.512	0.119	0.001	0.001	
Bahrain	1994-2001	0.375	0.156	0.024	0.000	0.407
	2002-2008	0.452	0.181	0.019	0.005	
Egypt	1994-2001	0.746	0.075	0.000	0.002	0.261
	2002-2008	0.625[a]	0.080	0.000	0.000	
Jordan	1994-2001	0.593	0.091	0.000	0.001	0.448
	2002-2008	0.480	0.116	0.001	0.001	
Kuwait	1994-2001	0.476	0.109	0.002	0.001	0.066
	2002-2008	0.299	0.123	0.038	0.000	
Lebanon	1994-2001	0.650	0.095	0.000	0.000	0.712
	2002-2008	0.627	0.088	0.000	0.000	
Morocco	1994-2001	0.277[a]	0.148	0.091	0.001	0.243
	2002-2008	0.503	0.083	0.000	0.000	
Oman	1994-2001	0.822	0.128	0.000	0.196	0.528
	2002-2008	0.678	0.185	0.005	0.116	
Qatar	1994-2001	0.079	0.309	0.805	0.021	0.152
	2002-2008	0.496	0.189	0.034	0.032	
Saudi Arabia	1994-2001	0.756	0.068	0.000	0.004	0.132
	2002-2008	0.605	0.103	0.000	0.002	
Tunisia	1994-2001	0.578	0.086	0.000	0.000	0.001
	2002-2008	0.376	0.089	0.001	0.000	
United Arab Emirates	1994-2001	0.882	0.088	0.000	0.195	0.124
	2002-2008	0.723	0.088	0.000	0.004	

Source: authors' calculations based on Bankscope data following the methodology described in Section 2.
[a] denotes cases where we reject the null that the market is in long-run equilibrium.

Table 4: H-statistics across regions

Regions	H-stat (94-08)	H-stat (02-08)
Middle East & Northern Africa	0.520	0.482
GCC Countries	0.497	0.470
Non-GCC Countries	0.528	0.508
P-value GCC = Non-GCC	0.64	0.64
East Asia	0.614	0.584
P-value H = H GCC	0.07	0.12
P-value H = H Non-GCC	0.02	0.14
Eastern Europe	0.685	0.694
P-value H = H GCC	0.00	0.00
P-value H = H Non-GCC	0.00	0.00
Former Soviet Union	0.659	0.669
P-value H = H GCC	0.01	0.00
P-value H = H Non-GCC	0.00	0.00
Latin America	0.743	0.765
P-value H = H GCC	0.00	0.00
P-value H = H Non-GCC	0.00	0.00
South Asia	0.710	0.677
P-value H = H GCC	0.00	0.01
P-value H = H Non-GCC	0.00	0.00
Sub-Saharan Africa	0.521	0.518
P-value H = H GCC	0.70	0.51
P-value H = H Non-GCC	0.83	0.85

Source: authors' calculations based on Bankscope data following the methodology described in Section 2.

Table 5: Lerner index for MENA countries across periods

Countries	Period	Lerner	P-value null 94-01 = 02-08
Algeria			
	1994-2001	0.288	0.00
	2002-2008	0.473	
Bahrain			
	1994-2001	0.248	0.00
	2002-2008	0.375	
Egypt			
	1994-2001	0.220	0.04
	2002-2008	0.193	
Jordan			
	1994-2001	0.147	0.00
	2002-2008	0.309	
Kuwait			
	1994-2001	0.217	0.00
	2002-2008	0.412	
Lebanon			
	1994-2001	0.119	0.01
	2002-2008	0.144	
Morocco			
	1994-2001	0.316	0.29
	2002-2008	0.288	
Oman			
	1994-2001	0.264	0.00
	2002-2008	0.399	
Qatar			
	1994-2001	0.283	0.00
	2002-2008	0.501	
Saudi Arabia			
	1994-2001	0.268	0.00
	2002-2008	0.470	
Tunisia			
	1994-2001	0.242	0.14
	2002-2008	0.211	
United Arab Emirates			
	1994-2001	0.332	0.00
	2002-2008	0.438	

Source: authors' calculations based on Bankscope data, following the methodology described in Section 2.

Table 6: The Lerner index across regions

Regions	Average Lerner (94-08)	Average Lerner (02-08)
Middle East & Northern Africa	0.320	0.373
GCC Countries	0.360	0.435
Non-GCC Countries	0.241	0.258
P-value GCC = Non-GCC	0.05	0.01
East Asia	0.230	0.265
P-value Lerner = Lerner GCC	0.00	0.00
P-value Lerner = Lerner Non-GCC	0.81	0.89
Eastern Europe	0.182	0.196
P-value Lerner = Lerner GCC	0.00	0.00
P-value Lerner = Lerner Non-GCC	0.24	0.24
Former Soviet Union	0.271	0.266
P-value Lerner = Lerner GCC	0.00	0.00
P-value Lerner = Lerner Non-GCC	0.52	0.86
Latin America	0.215	0.234
P-value Lerner = Lerner GCC	0.00	0.00
P-value Lerner = Lerner Non-GCC	0.58	0.63
South Asia	0.244	0.272
P-value Lerner = Lerner GCC	0.02	0.00
P-value Lerner = Lerner Non-GCC	0.97	0.80
Sub-Saharan Africa	0.223	0.169
P-value Lerner = Lerner GCC	0.04	0.02
P-value Lerner = Lerner Non-GCC	0.81	0.45

Source: authors' calculations based on Bankscope data, following the methodology described in Section 2

Table 7: Potential determinants of competition

Regions	Assets held by top 3 banks (%)	Minimum capital req. (mill USD)	Application for bank licenses denied (%)	Number of entry req.	Credit Info. Index	Stock market cap. (%)	Non-bank financial inst. assets to GDP (%)
Middle East & Northern Africa	57.8	91.8	24.2	8	2.9	77.2	12.4
GCC Countries	54.3	158.4	23.9	8	3.3	87.5	4.1
Non-GCC Countries	60.7	38.4	24.5	8	2.6	67.0	14.5
East Asia	45.1	216.7	4.6	8	4.2	72.7	42.9
Eastern Europe	59.3	8.1	7.6	7.8	3.6	22.7	12.7
Former Soviet Union	60.1	7.6	20.2	7.5	2.0	27.8	5.0
Latin America	50.3	28.6	7.8	7.5	5.1	23.6	20.9
South Asia	45.0	27.6	21.6	6.7	3.2	40.9	25.3
Sub-Saharan Africa	70.1	10.0	12.7	8	2.0	56.2	43.7

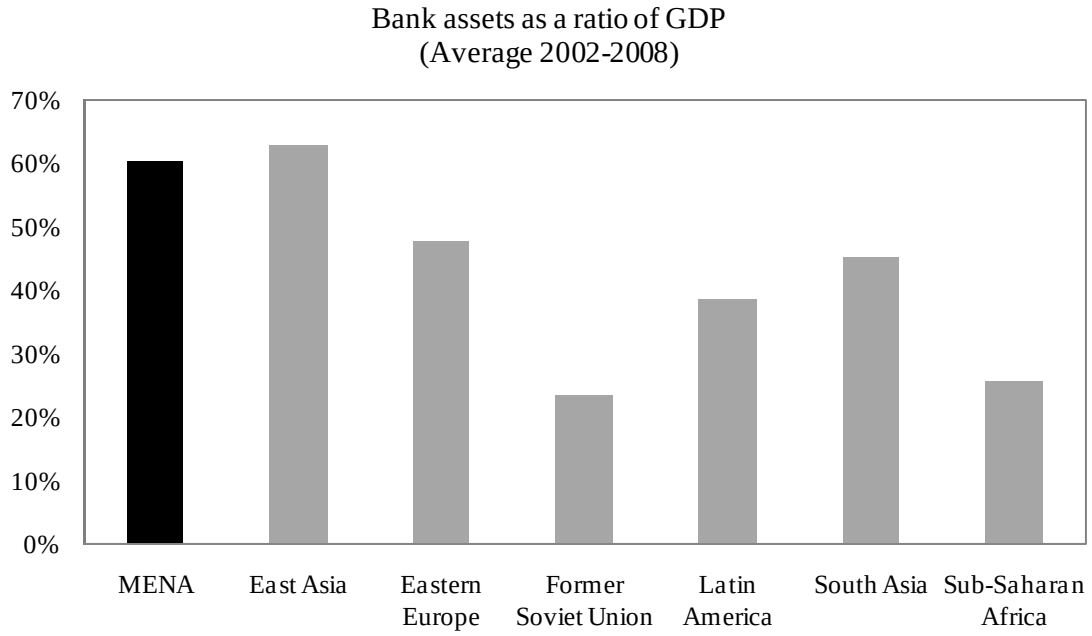
Source: *Assets held by top 3 banks* was calculated by the authors using data from Bankscope; *Minimum capital requirements*, *Applications for bank licenses denied*, and *Number of entry requirements* come from the World Bank 2007 Survey on Bank Regulation and Supervision. The *Credit information index* was taken from the World Bank Doing Business Indicators, whereas the *Stock market capitalization* comes from Beck and Demirgüç-Kunt (2009). *Non-bank financial institutions assets to GDP* was computed using a variety of sources such as OECD, International Federation of Pension Funds Administrators, Investment Company Institute, AXCO Insurance Information Service, and national sources.

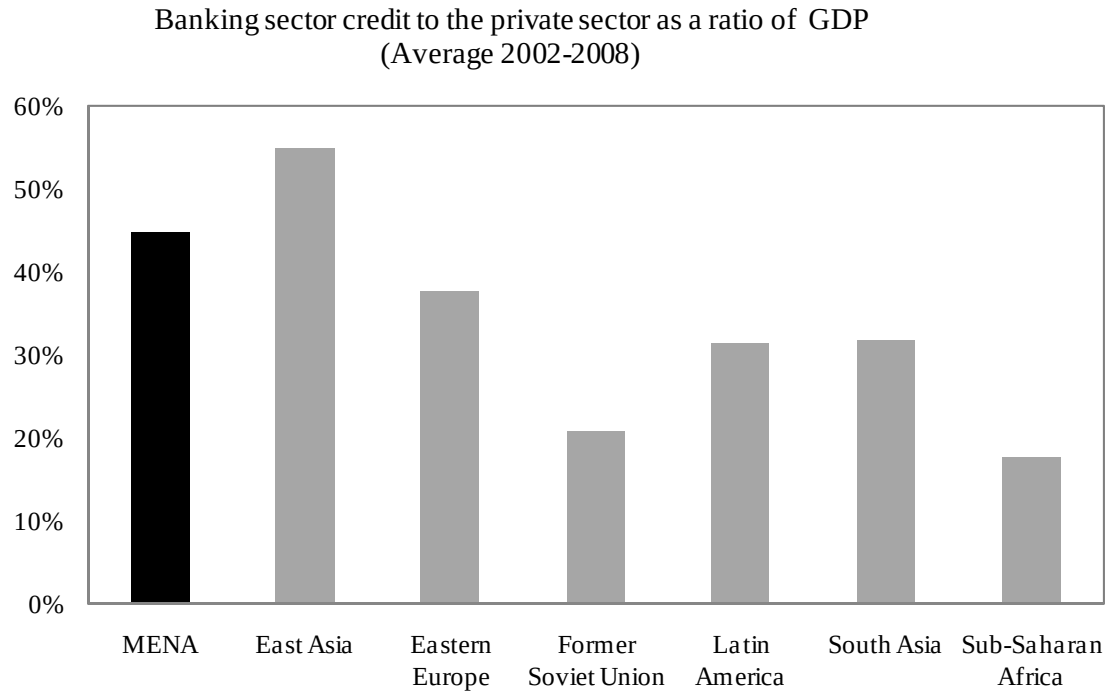
Table 8: Exploring the determinants of bank competition across regions

Independent variables	Dependent variable: H-statistic			
Dummy MENA = 1	-0.137	-0.079	-0.106	-0.016
	[-3.04]***	[-1.64]	[-1.97]*	[-0.20]
Concentration		-0.161	-0.035	-0.167
		[-1.09]	[-0.20]	[-1.06]
Credit Information Index		0.036	0.024	0.03
		[2.79]***	[1.87]*	[2.09]**
Minimum capital requirement (billions)		-0.013	-0.173	-0.03
		[-0.09]	[-1.05]	[-0.16]
Percentage of bank license applications denied		-0.084	-0.266	-0.081
		[-0.98]	[-2.25]**	[-0.81]
No. of entry requirements		-0.065	-0.108	-0.093
		[-1.99]*	[-3.30]***	[-2.92]***
Stock market capitalization			0.139	
			[3.21]***	
Non-bank financial institutions				0.169
				[3.10]***
Constant	0.657	1.127	1.42	1.341
	[28.48]***	[4.69]***	[5.52]***	[5.08]***
Observations (number of countries)	67	54	45	43
R-squared	0.081	0.381	0.499	0.464

Robust t-statistics are shown in parentheses. *,**, and *** denote significance at the 10, 5 and 1 percent, respectively.

Figure 1: Banking sector size and depth across regions





Source: World Bank Financial Structure Database

Figure 2: Lerner index for MENA countries

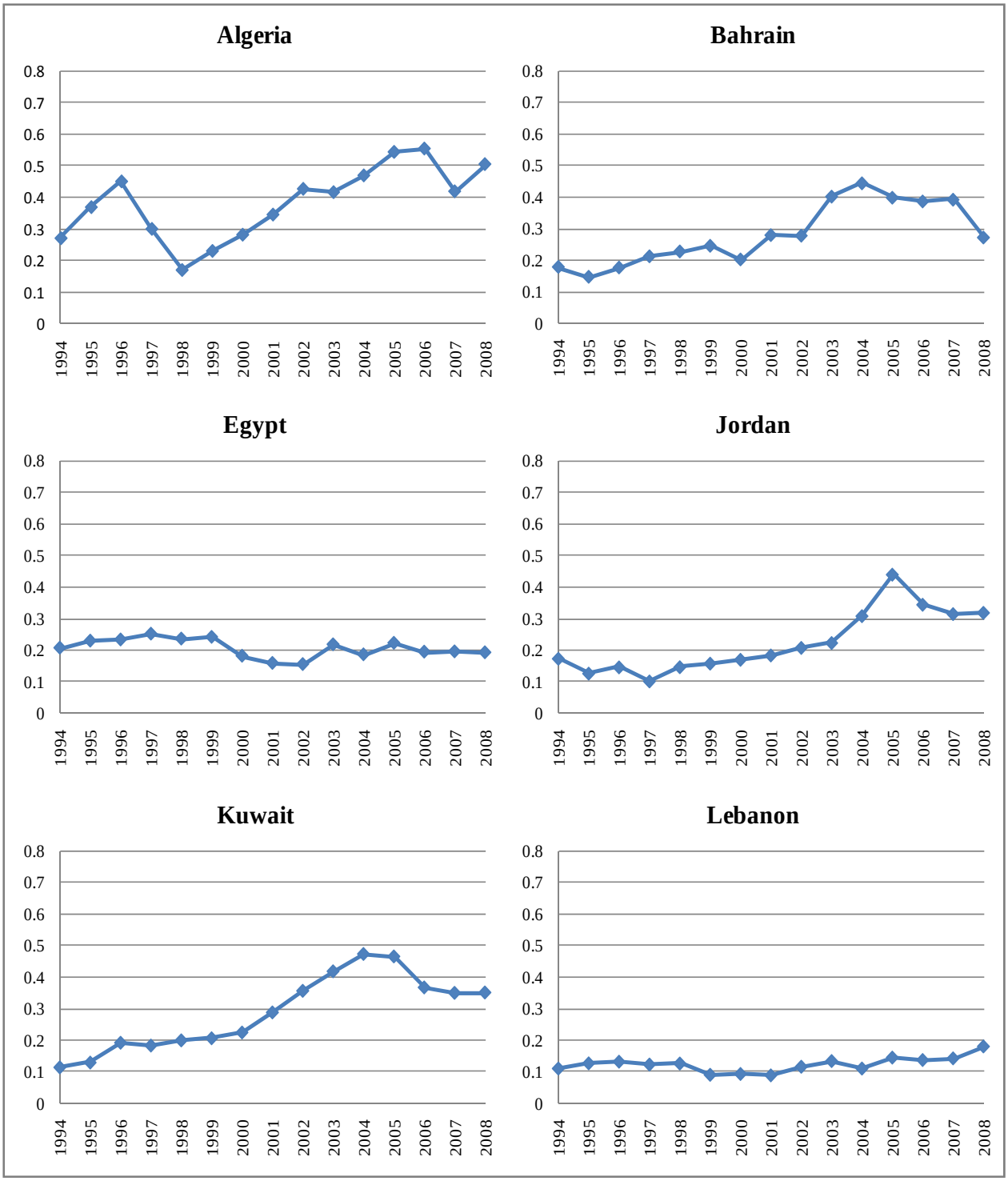


Figure 2: Lerner index for MENA countries (continued)